

117 Cautionary Signals have been displayed at the 43 Signal Stations on the Lakes and Atlantic coasts, of which 65 were reported well justified by the succeeding high winds, while 48 were partially justified, and 4 were too late; 49 occasions were noted on which brisk winds were not signaled, in the most of which cases, however, the winds did not come from dangerous points of the compass.

NAVIGATION.

Ice.—Ice moved out of the harbor of Escanaba on the 4th. In the eastern portion of Lake Ontario ice continued to impede navigation until the 14th. Sabago Lake, in Maine, was opened to navigation on the 4th. The navigation of the larger Lakes was continued throughout the month. Lake Champlain was generally open on the 30th of April, being the latest date for 60 years—it had been closed for 104 days—the longest period, with one exception, during this century.

The extreme depth of water in the Mississippi and its tributaries is shown by the table on chart No. III, whence it appears that at all river stations the water was, in the last week of the month, from 3 to 30 feet lower than during the first week.

TEMPERATURE OF THE WATER.

The temperature of the water has varied between 29° and 40° at Eastport, Maine, but between the extremes, 74° and 87° at Key West, Florida, the change being quite gradual as we proceed southward along the Atlantic coast. The range of temperature has increased from 5° in Maine to 13° along the South and Middle Atlantic coasts, but to 18°, 20° and 30° in the rivers and lakes in the interior of the country. The details, for all stations, are given in the table on Chart No. II.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—Displays of thunder and lightning have been least frequent in the Middle Atlantic States, where they have occurred on the 7th, 12th, 15th, 16th, 19th and 23d, and in southern New England, where they have occurred on the 1st, 2d, 8th, 9th, 12th, 15th, 19th, 20th, 24th, 29th and 30th. They have been most frequent in the Eastern Gulf States, Tennessee and the Ohio valley, the upper Mississippi and lower Missouri valleys, where they have occurred on from 16 to 20 days during the month.

Auroras.—The auroras most extensively visible were those of the 4th, in Connecticut, Maine, New York, Michigan, Wisconsin, Minnesota; on the 22d, in Connecticut, Maine, New Hampshire, Vermont, Massachusetts, New York, Ohio, Michigan, Wisconsin and Minnesota. Less extensive displays, were reported from two or more stations, on the 2d, 3d, 5th, 7th, 9th, 10th, 11th, 12th, 13th, 15th, 16th, 18th, 23d, 24th, 26th, 27th, 29th, 30th and 31st.

OPTICAL PHENOMENA.

(1) *Solar Halos* were observed at some stations on every day of the month but the 23d. The following is a list of those observed in two or more different States: 1st, Maine, Massachusetts, New Hampshire, New York, Connecticut, Georgia, and New Jersey; 2d, Iowa and Georgia; 3d, Illinois, Maine, Missouri, New York, North